

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number
WO 2005/056644 A2

(51) International Patent Classification⁷: **C08J 3/00**

GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(21) International Application Number:
PCT/US2004/032650

(22) International Filing Date: 1 October 2004 (01.10.2004)

(25) Filing Language: English

Declarations under Rule 4.17:

(26) Publication Language: English

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

(30) Priority Data:

60/509,679 8 October 2003 (08.10.2003) US
60/538,534 22 January 2004 (22.01.2004) US
60/539,250 26 January 2004 (26.01.2004) US

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*
— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*
— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*
— *of inventorship (Rule 4.17(iv)) for US only*

(71) Applicant (for all designated States except US): **POLY-ONE CORPORATION** [US/US]; 33587 Walker Road, Avon Lake, OH 44012 (US).

Published:

(72) Inventors; and
(75) Inventors/Applicants (for US only): **JARUS, David** [US/US]; 3008 Claremont Road, Shaker Hts., OH 44122 (US). **CICERCHI, Jeff** [US/US]; 281 Eaton Ridge Drive, Apt. 206, Sagamore Hills, OH 44067 (US).

— *without international search report and to be republished upon receipt of that report*

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

WO 2005/056644 A2

(54) Title: NANOCLAY-CONTAINING COMPOSITES AND METHODS OF MAKING THEM

(57) Abstract: A composite of nanoclay and thermoplastic matrix polymer is disclosed, optionally containing a polyolefin elastomer and also optionally containing a dispersion agent for the nanoclay. The nanocomposite is prepared for use with thermoplastic polyolefins (TPO's). The polyolefin elastomer, preferably an ethylene-octene copolymer, is added into a mixing extruder downstream of the other ingredients. The nanoconcentrate contributes increased stiffness and toughness to a TPO, which can be used for molded articles such as automotive parts.